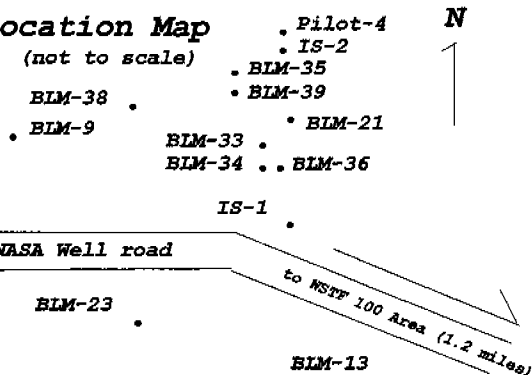


# WSTF Well Borehole Lithologic/Geophysical log

## Location Map

(not to scale)



Site I.D: NASA-WSTF

Location I.D: BLM-36

County and State: Dona Ana County, New Mexico

Site Coordinates: N-228442.35 E-407940.65

Ground Elevation: 4638.62'

Total Depth of Borehole: 960'

Depth to Bedrock and Type: 330'-Altered porphyritic dacite

Depth to Groundwater from Geophysics: 320 ft.

Drilling Method(s): Mud rotary, reamed 17.5" hole to 100'.

Set 14" surface casing to 100'; drilled 12.25" hole to 960'.

Drilling Contractor: Stewart Brothers Drilling Co.

Geophysical Survey Contractor: Southwest Geophysical, Inc.

ATSC Field Representative(s): M. Canavan, G. Giles,

L. Hunnicutt, J. Pearson, and M. Rivera

Dates Drilling Started and Completed: 1/19/99 to 2/5/99

Comments: Retrofit Westbay well inside 4.5" OD stainless steel casing (contains 4 sampling zones). Lithologic samples collected every 10'.

## Location Description

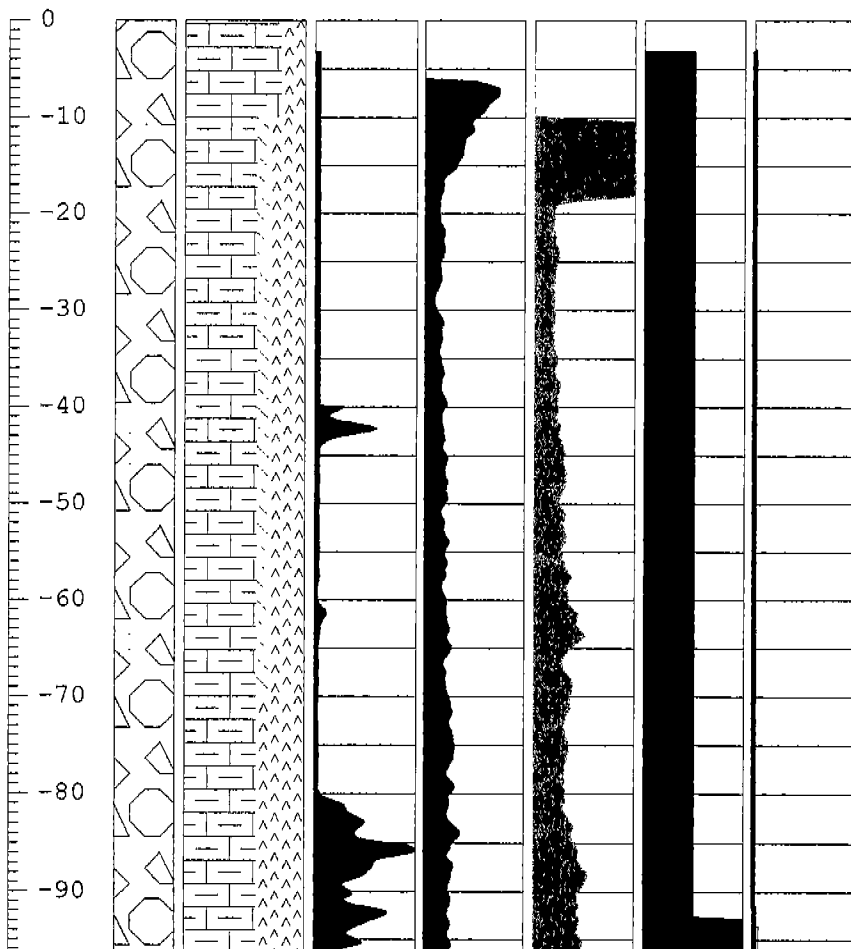
Quarter 1: Center Section: 33

Quarter 2: SE 1/4 Township: T20S

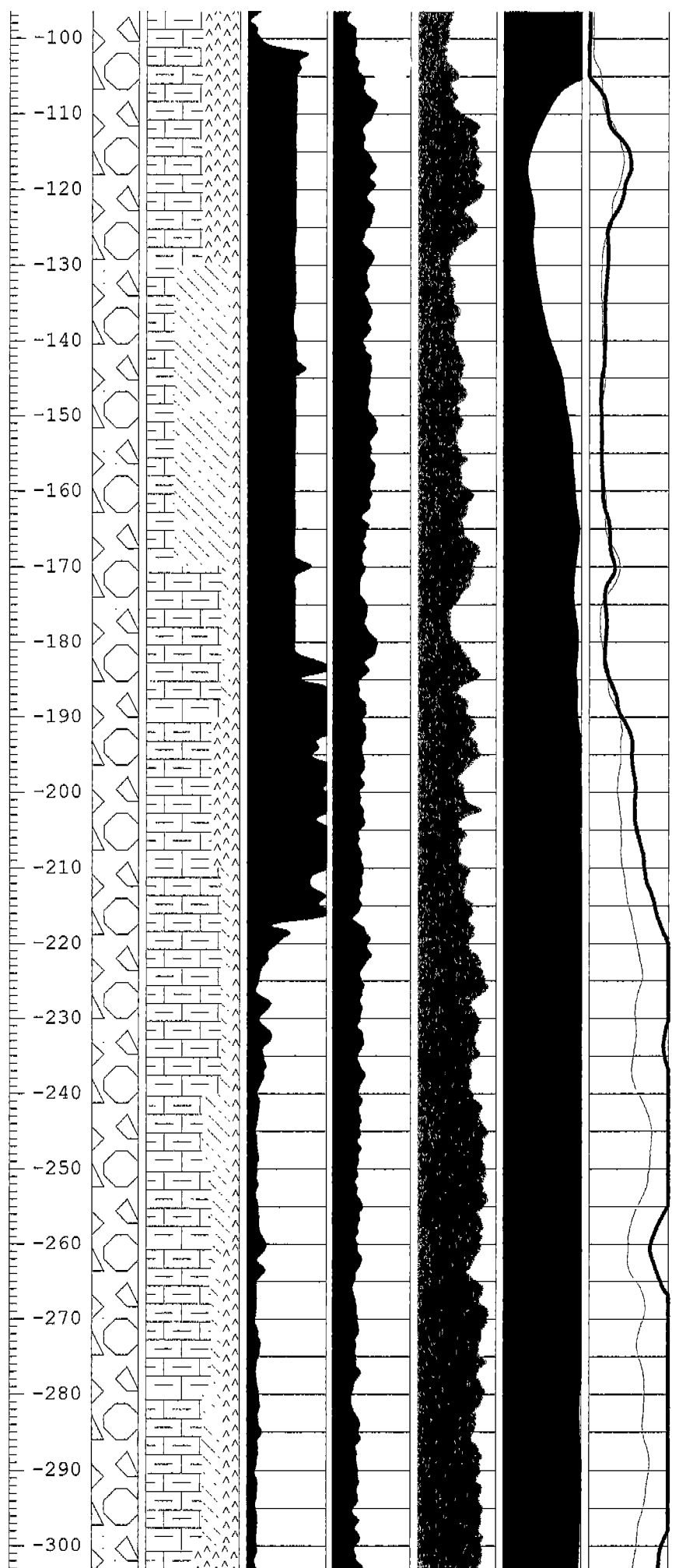
Quarter 3: SE 1/4 Range: R3E

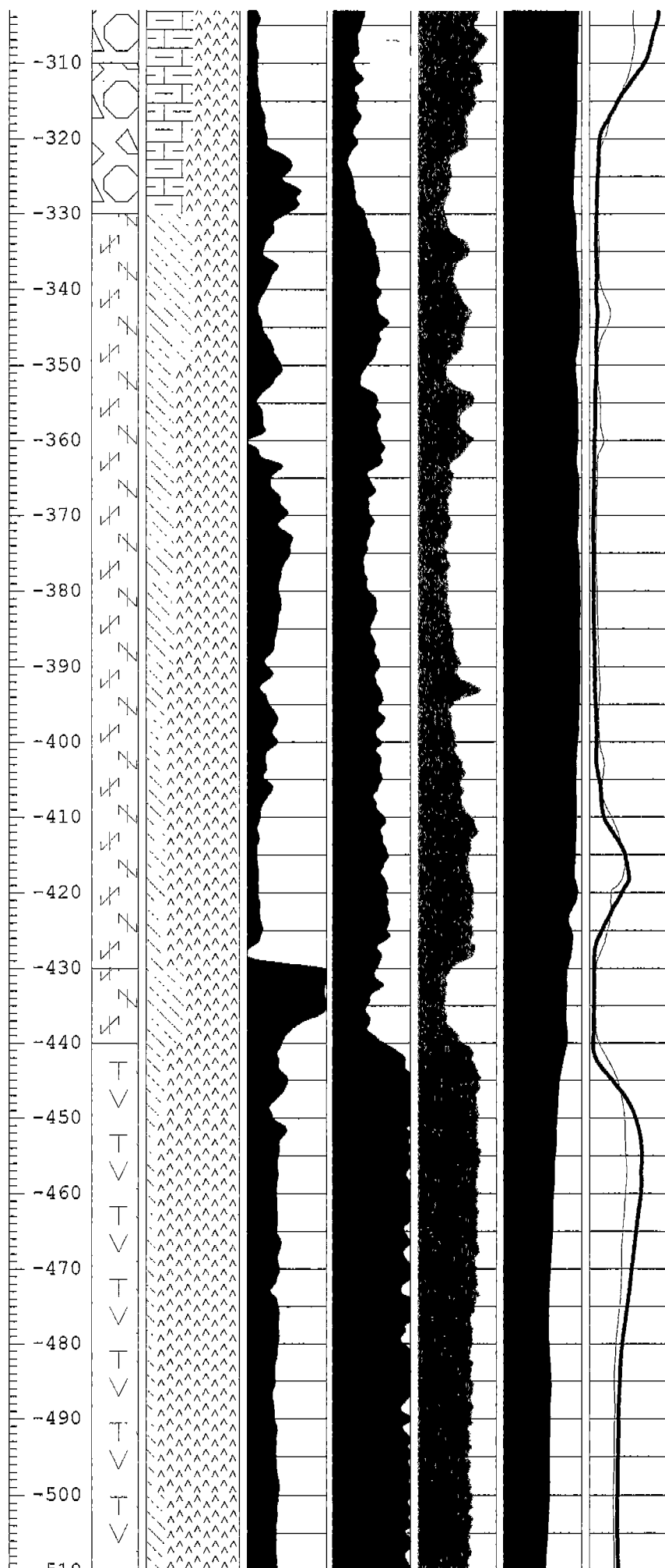
Location Description: Well BLM-36 is located on the same well pad as BLM-33 and BLM-34 approximately 1.5 miles northwest of the 100 Area just north of the NASA well road.

| Depth<br>(Feet) | Lith-<br>ology | Visual<br>Percent | Sonic<br>Porosity<br>(Msec./<br>ft.) | Gamma<br>API | Neutron<br>API | SP<br>(Milli-<br>volts) | Resis-<br>tivity<br>(OHM-M)<br>64"-green<br>16"-red | Lithologic Description |
|-----------------|----------------|-------------------|--------------------------------------|--------------|----------------|-------------------------|---|------------------------|
|                 |                | 0 100             | -5 100                               | 0 250        | 0 1250         | -50 50                  | 0 150   |                        |



ALLUVIUM: Santa Fe Group (0-330 feet): Alluvial cuttings consist of polygenetic, multi-colored clasts with localized clay-rich intervals. Clasts generally comprise 30-60% of the lithologic samples. Clasts within the alluvium consist of: 1) 25-80% gray black (N2) to green black (5GY 2/1), angular to rounded, coarse sand to coarse gravel-sized, micritic limestone clasts that display abundant calcite-filled fracture veins, 2) 0-50% moderate reddish brown (10R 4/6), moderate pink (5R 7/4) to gray green (10GY 5/2), angular to subrounded, coarse sand to gravel-sized, volcanic clasts (rhyolite, rhyolite tuff, andesite, clay-altered volcanics, dacite, rhyodacite), 3) 0-50%, pale red brown (10R 5/4) to light brown (5YR 6/4) clay. Other clasts observed include gray green (10GY 5/2) chert, disseminated milky quartz and pale red brown silt (10R 4/6). The amount of clay and volcanic clasts increases with depth. The Santa Fe Group Alluvium directly overlies Tertiary volcanic bedrock and is marked by a 20-foot thick, pebble/clay-rich horizon.



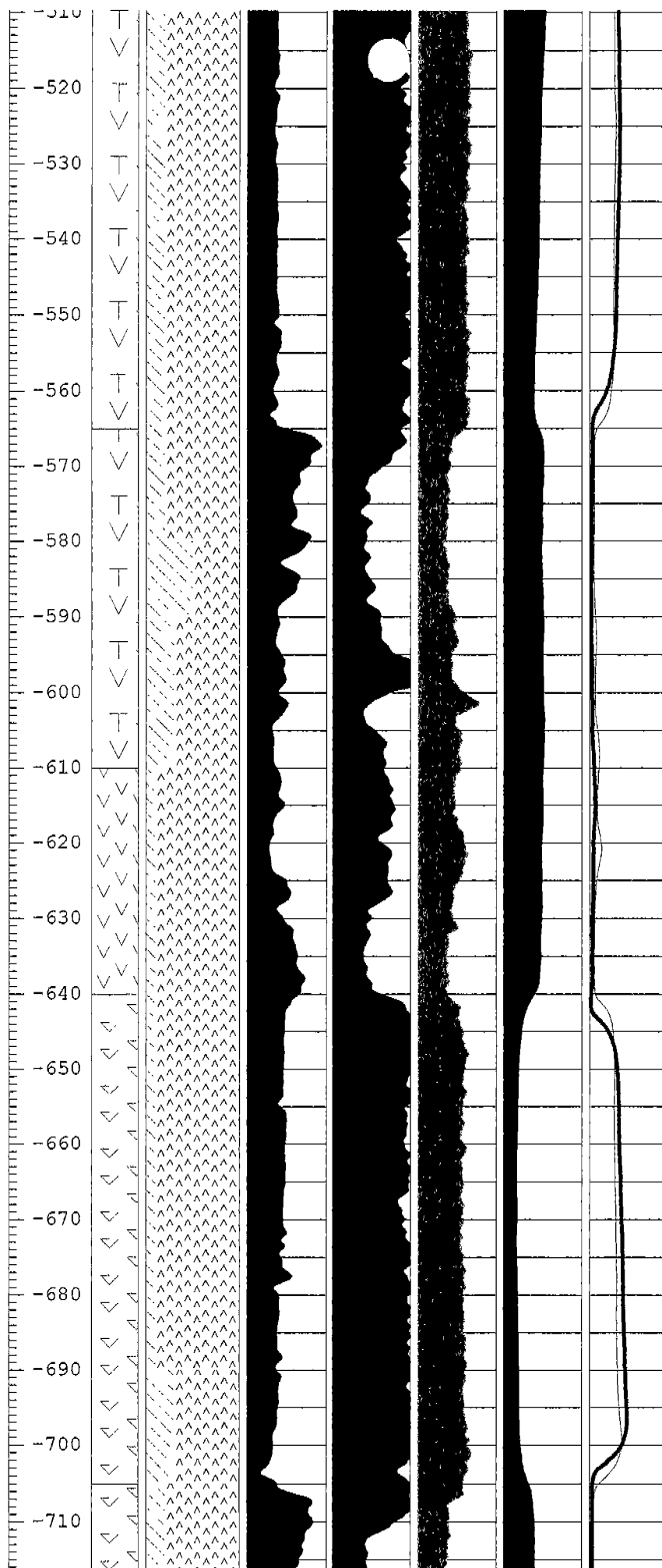


**ALLUVIUM: (310-330 feet):** Base of volcanic/clay-rich alluvium marks the bedrock contact.

**ALTERED PORPHYRITIC DACITE: (330-440 feet):** Altered porphyritic dacite is pale red purple (5RP 6/2) to pale pink (5RP 8/2) and weathers the same. This rock consists of 20% euhedral plagioclase phenocrysts, 20% anhedral to subhedral milky quartz phenocrysts, and <5% biotite phenocrysts within a 20-55%, pale red purple, aphanitic, felsic groundmass. This unit consists of 20-30% degraded clay.

**(430-440 feet):** The degree of clay alteration has increased from 20% to 40%.

**RHYOLITE TUFF: (440-565 feet):** Rhyolite tuff is light gray (N7) and weathers the same. This rock consists of 10% subhedral plagioclase phenocrysts, 5% subhedral quartz phenocrysts, and <2% subhedral biotite phenocrysts within a 65% partially altered, felsic groundmass. This unit is composed of 10-20% degraded clay.

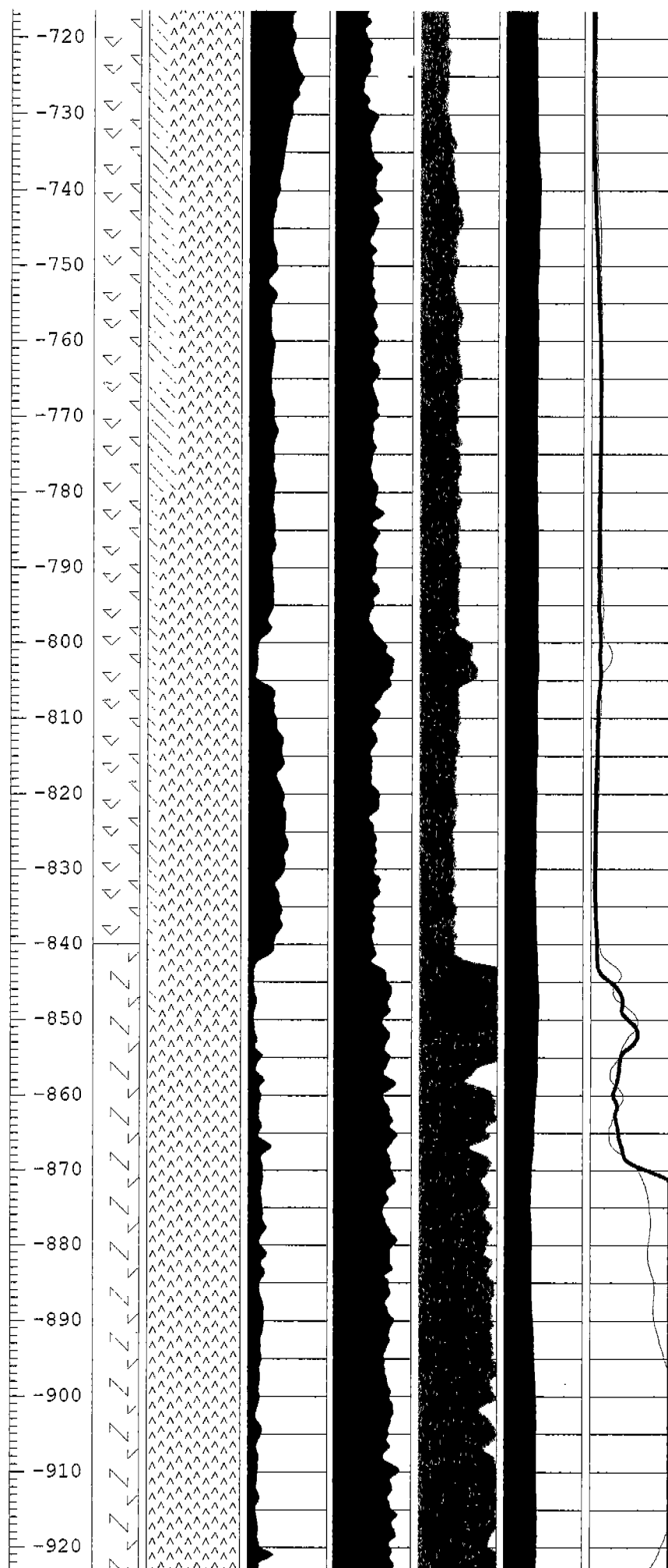


**RHYOLITE TUFF: (565-610 feet):** Rhyolite tuff is light brown (5YR 5/6) to pale reddish brown (10R 5/4) and weathers the same. This rock has an aphanitic-porphyritic texture and consists of 15% subhedral plagioclase phenocrysts, 5% subhedral biotite phenocrysts, and 5% anhedral quartz phenocrysts within a variable 75% altered groundmass. This unit contains as much as 60% altered clay.

**RHYOLITE: (610-640 feet):** Rhyolite is pale green (5G 7/2) to very pale orange (10YR 8/2) and weathers the same. This rock has an aphanitic-porphyritic texture and consists of 10-20% euhedral to subhedral phenocrysts of biotite, 10-20% euhedral phenocrysts of plagioclase, and 10% anhedral phenocrysts of quartz within a 50-70% aphanitic, felsic groundmass. 10% of this unit is composed of altered clay.

**ALTERED RHYOLITE: (640-705 feet):** Altered rhyolite is very pale orange (10YR 8/2) to grayish orange (10YR 7/4) and weathers the same. This rock has an aphanitic microporphyritic texture and consists of 10% subhedral phenocrysts of biotite, plagioclase, and hornblende. Individual crystals are difficult to identify due to the pervasive nature of secondary alteration. Clay comprises 10-30% of the samples.

**ALTERED RHYOLITE: (705-840 feet):** Altered rhyolite is pale green (5G 7/2) and weathers the same. This rock has an aphanitic-porphyritic texture and consists of 10-20% euhedral to subhedral phenocrysts of biotite, 10-20%



euهدral phenocrysts of plagioclase, and 10% anhedral phenocrysts of quartz within a 50-70% aphanitic, felsic groundmass. Altered clay comprises 10-30% of this unit. Propylitic alteration is pervasive.

**PORPHYRITIC DACITE: (840-960 feet):**  
Porphyritic dacite is dusky red (5YR 3/4) and weathers pale red (5R 6/2). This rock has an aphanitic-porphyritic texture and consists of 40% subhedral phenocrysts of plagioclase, 5% euهدral phenocrysts of biotite, and 5% anhedral phenocrysts of quartz within a 50% aphanitic, felsic groundmass. The unit is indurated with less than 5% consisting of altered clay.

